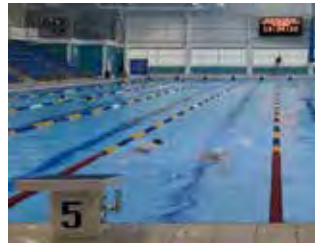




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architecture : engineering : building consultancy



PLOT 5, ASHROYD BUSINESS PARK, HOYLAND, BARNSELY

NETWORK SPACE DEVELOPMENTS LTD

DRAINAGE STRATEGY

11717-WMS-ZZ-XX-RP-C-39201-S8-P1-DRAINAGE_STRATEGY

MARCH 2018

DOCUMENT CONTROL



Contract: Plot 5 Ashroyd Business Park, Hoyland, Barnsley

Document Title: Drainage Strategy

Our Ref: 11717-WMS-ZZ-XX-RP-C-39201-S8-P1-DRAINAGE_STRATEGY

Prepared by: C.Melton EngTech MICE MCIHT MIHE **Date:** 29th March 2018

RECORD OF AMENDMENTS TO DOCUMENT

Ref	Description	Date

Verified by: A.Gibson BEng CEng MICE MCIHT MIRSE **Date:** 29th March 2018

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3.0	FLOOD RISK
4.0	DRAINAGE STRATEGY
5.0	CONCLUSIONS

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1.0 INTRODUCTION

William Saunders have been instructed by Network Space Developments Ltd to prepare a Drainage Strategy for an industrial development at Plot 5, Ashroyd Business Park, Hoyland, Barnsley.

2.0 PROPOSED DEVELOPMENT

2.1 SITE LOCATION AND DESCRIPTION

The site currently comprises rough grassland and is an un-developed plot of a business park. The business park was initially re-developed in from 2005 to 2006, plateaus were constructed into the pre-existing hillside to allow development. The grid reference for the site is 436564E, 401164N or SE365011. The postcode of the site is S74 9ND. A location plan is given in Appendix A.

To the north is plot 4 of Ashroyd business park, the western section is currently used as a self-storage warehouse, the eastern section currently has planning permission for the development of class B1, B2 and B8 use. To the west plot 3 is proposed to have similar uses. To the south is an existing residential area, to the east is an existing warehouse and to the south-east is Hampton House which is used as office space.

Further north are plots 1 and 2 of the business park with the A6195 Dearne Valley Parkway beyond. Further west the land is undeveloped consisting of rough grazing. Further east is Platts Common industrial estate and to the south is the residential area of Hoyland.

The A6195 is approx. 350m north and the M1 is approx. 1.9km south-west. The centre of Barnsley is approx. 5.5km NNW, Rotherham is approx. 10km south-east, Sheffield is approx. 13km south and Doncaster is approx. 20km east.

The site is a previously levelled plateau which lies between approx. 154 and 158mOD, there is a gentle fall to the west across the majority of the site. There are batters along the north (7m below site level), south (5m above site level) and east (2m above site level).

The site has an approximate area of 1.5 hectares.

2.2 DEVELOPMENT PROPOSALS

The proposals are for a new development of 4 industrial units with a new access road. Each unit has a separate access point, yard and allocated parking spaces. The proposed site layout is shown at Appendix B.

3.0 FLOOD RISK

Current GOV.uk records indicate that the proposed development site is wholly within Flood Zone 1 and as such is not located in an area considered to be at risk of flooding from fluvial, tidal or any natural or artificial water bodies.

The surface water flood map indicated areas of low to high flooding in channels around the perimeter of the site. These are related to the drainage channels that have been constructed at the base of the embankments in order to convey run off to the land drainage system. These channels are to be retained through French drains within the new development. The French drains will be used to direct the surface water runoff from higher levels around the built development away from the buildings.

The current GOV.uk Flood Risk Maps are given in Appendix C.

4.0 DRAINAGE STRATEGY

Through the initial enabling works for the wider Ashroyd Business Park new infrastructure including adoptable foul and surface water sewers were constructed. The Section 104 sewer layout as built drawings can be found in Appendix D

4.1 FOUL DRAINAGE

The foul drainage from the development is to be discharged to the 150mm diameter stub to FPN 1.002. The adoptable sewer network installed has been sized up to be able to allow for the future development from Plot 5.

4.2 SURFACE WATER DRAINAGE

The drainage for the business park benefits from an off-site attenuation pond, built specifically for the site.

During the S104 approval process for the wider infrastructure allowable flow rates were determined for the individual plots across the business park. For Plot 5 the allowable discharge rates in each storm period were agreed with Yorkshire Water as the following, from an impermeable area of 15463.80m² (1.54ha):

1 year = 208.9 l/s

30 year = 485.4 l/s

100 year = 587.2 l/s

For the proposed development at Plot 5, it is proposed to achieve the agreed discharge rates with at least an additional 30% reduction, therefore the proposed modelled discharge rates from Plot 5 are not to exceed the following:

1 year = 125.6 l/s

30 year = 299.6 l/s

100 year (+ 30% climate change) = 408.5 l/s

The connection to the surface water sewer will be through the 375mm diameter stub connected to PN 1.002.

4.3 FLOOD RISK/DRAINAGE MANAGEMENT STRATEGY

In order to manage the run off from the developed site, and accommodate future climate change, the detailed design of the surface water drainage system will need to include the following: -

- **Petrol/Oil Interceptors**

All the service yards are to include a Full Retention petrol interceptor to treat the service yard area before the surface water is connected into the surface water system.

- **Flood Flow Routes**

To address the residual risks of surface water flows and potential infrastructure failure, flow routes for such waters should be analysed and demonstrated to not present a hazard to the development or adjacent properties.

- **Floor Levels**

Floor levels to be set a minimum of 150mm above prevailing ground levels in Flood Zone 1 and above adjacent ground levels in areas of flood flow routes and areas at risk from surface water flooding to minimise the flood risk.

- **Design/Construction Standard**

All on-site foul and surface water drainage will be designed and constructed in accordance with current Building Regulation Standards.

5.0 CONCLUSIONS

- The proposed development is not at risk of flooding from fluvial, tidal or any natural or artificial water bodies.
- The development will generate quantities of surface water runoff which could pose flood risk to the development itself or to its neighbours, unless appropriate design and management measures are taken.
- The surface water runoff generated by the proposed development will be managed in a manner which will ensure no risk of flooding or increased risk to surrounding properties, at present and taking into account allowances for future climate change.
- The residual risks from surface water and infrastructure failure will be addressed by consideration of flood flow routes through the development.
- Floor levels to be set to minimise the flood risk from adjacent areas at risk from surface water flooding.

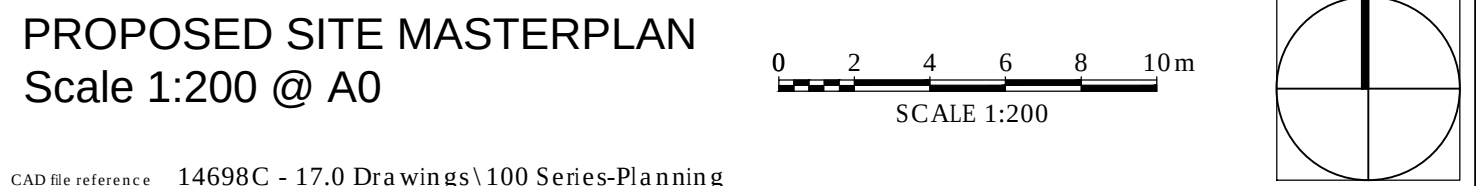
APPENDIX A

Site Location Plan



APPENDIX B

Proposed Site Layout



APPENDIX C

EA Flood Risk Map

Flood map for planning

Your reference
Plot 5

Location
436560/401165

Created
20 Mar 2018 2:18

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

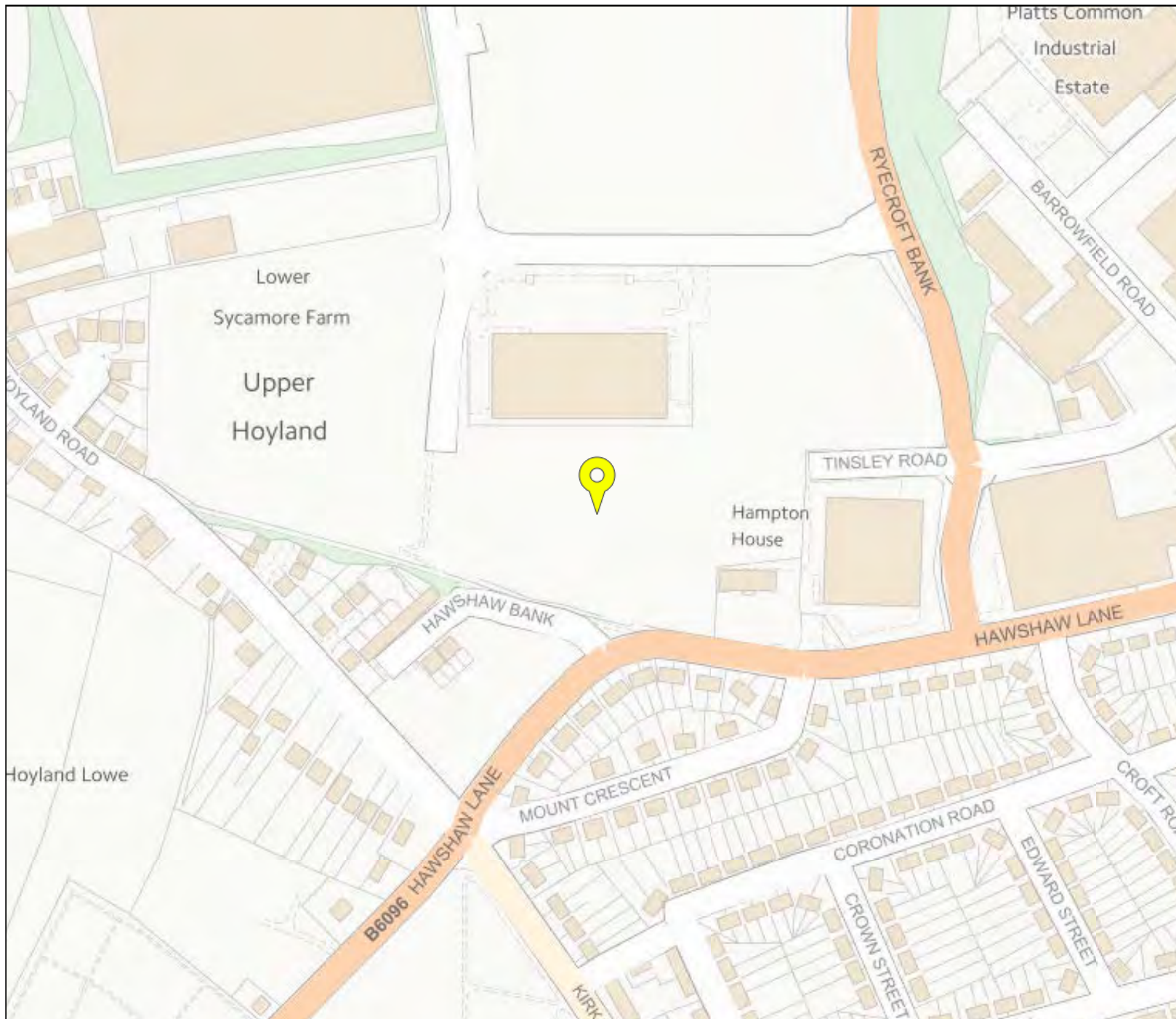
- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

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<https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>



Flood map for planning

Your reference

Plot 5

Location

436560/401165

Scale

1:3125

Created

20 Mar 2018 2:18

 Development location

 Flood zone 3

 Flood zone 3: areas benefitting from flood defences

 Flood zone 2

 Flood zone 1

 Flood defence

 Main river

 Flood storage area



Flood risk from rivers or the sea

Flood risk from surface water

Flood risk from reservoirs

Extent of flooding

Extent of flooding

Extent of flooding



Flood risk

High

Medium

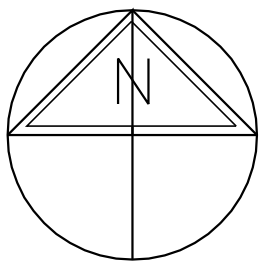
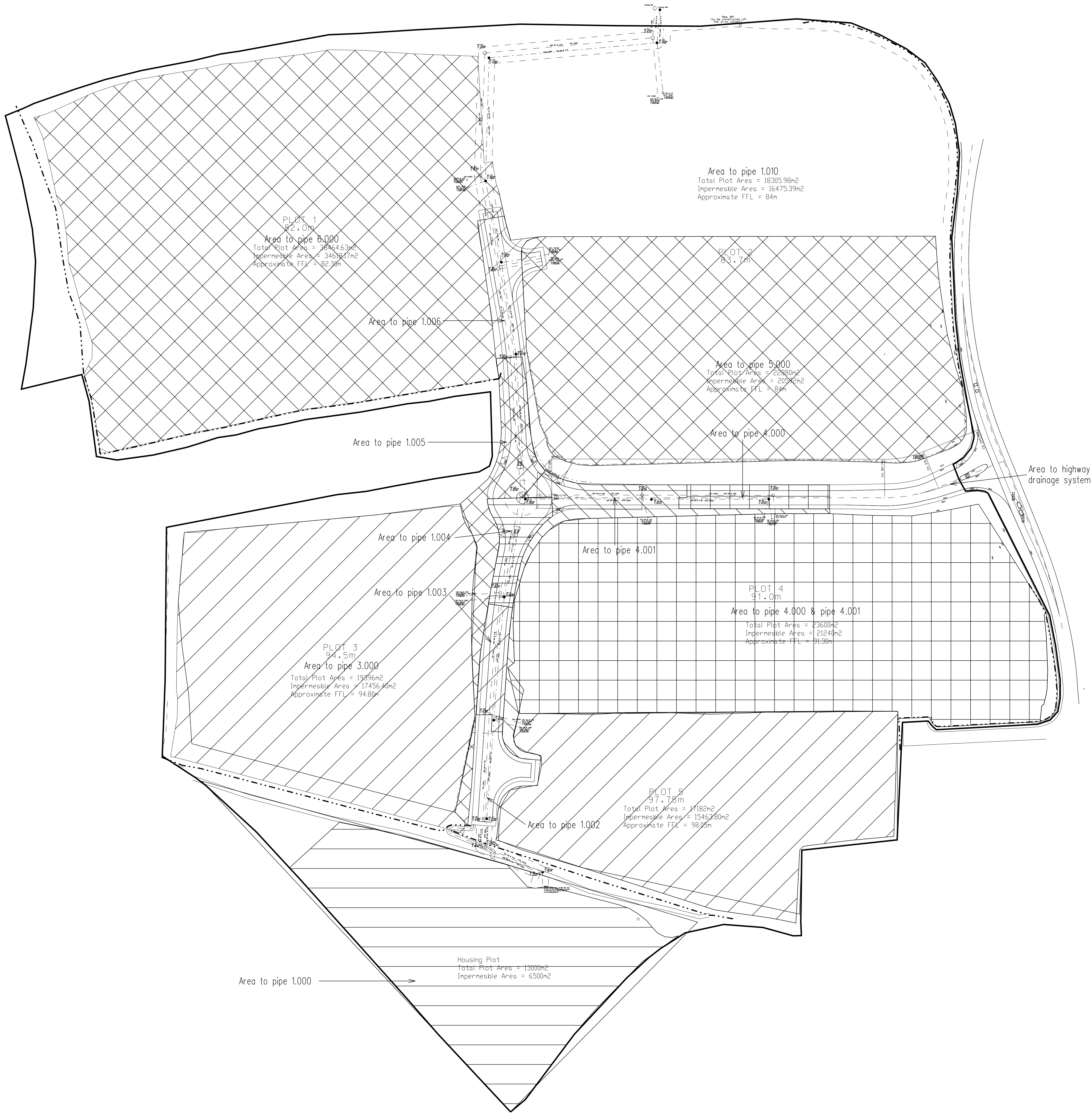
Low

Very low

Location you selected

APPENDIX D

S104 As Built Sewer Layout



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Contractors must verify all dimensions at the site before commencing any work or making any shop drawings: no dimensions to be taken from drawing

In accordance with CDM Regulation 13, residual hazards have been identified and are annotated thus:

Refer to the current designers risk assessments for further details

VERIFICATION STATUS	VERIFIED BY	DATE
INFORMATION		
DESIGN	ACG	09/00
BUILDING CONTROL		
PLANNING	ACG	09/00
MEASUREMENT	ACG	09/00
TENDER		
CONSTRUCTION		
FINAL ISSUE INCORPORATING ALL AUTHORISED VARIATIONS		
RISK ASSESSMENT ck'd		

ACCESS/DDA COMPLIANCE CHECK	DATE

REV	DESCRIPTION	CK'D	DATE
A	Redrawn	ACG	01/05
B	General redesign to SFA 5th	ACG	07/05
C	Plot Areas, Impermeable Areas and FFL added	ACG	08/05
D	Plot Areas& Impermeable Areas amended	ACG	09/05

ARCHITECTS
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QUANTITY SURVEYORS
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INTERIOR DESIGNERS
PROJECT MANAGERS
BUILDING SURVEYORS
PLANNING SUPERVISORS

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website: www.wm-saunders.co.uk

Project

Proposed Infrastructure Works,
Ashroyd Business Park,
nr. Barnsley.

Client
Ackroyd & Abbott Ltd.

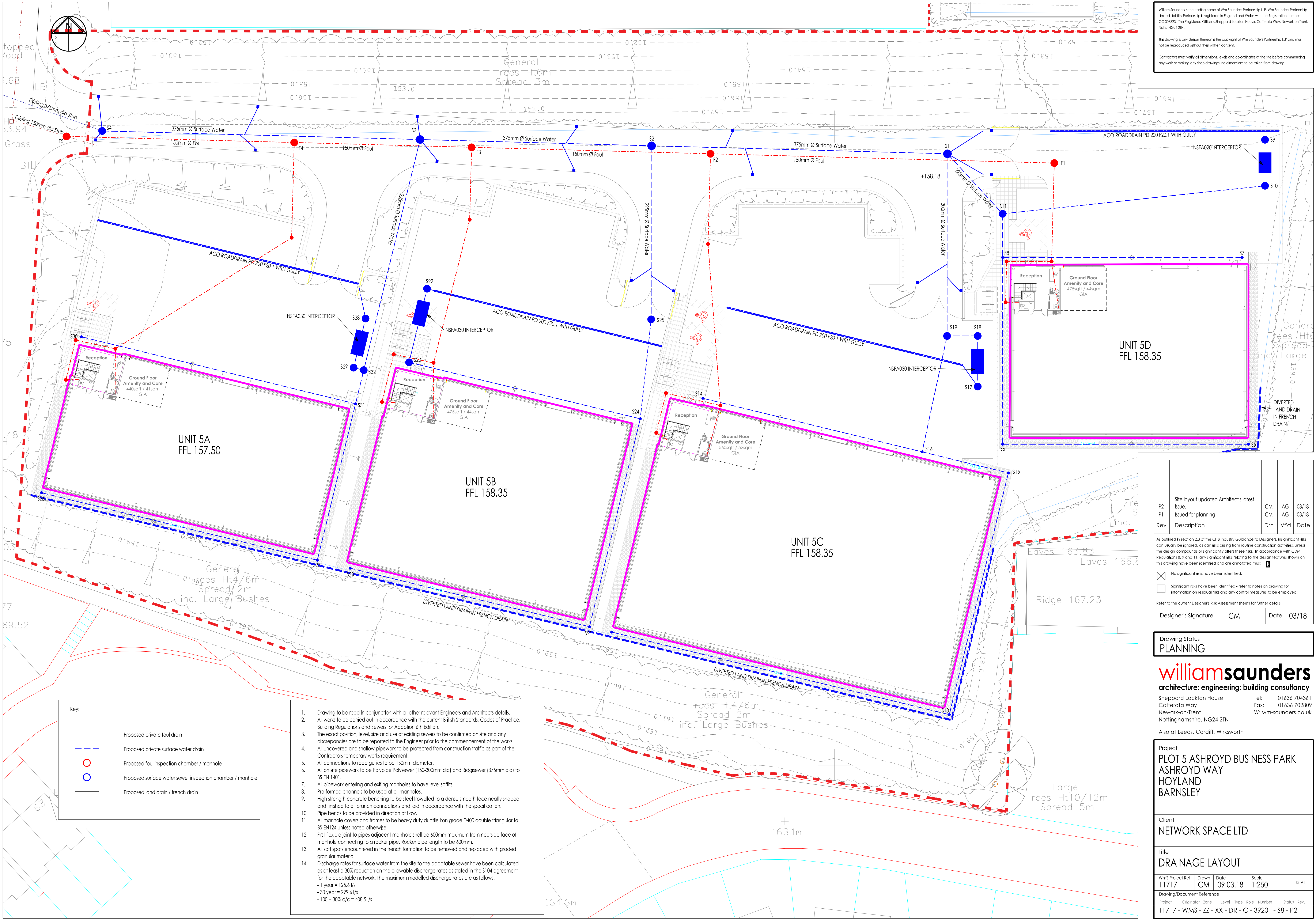
Title
S.104 Works - Areas

Date Sept '00 Drawing No. SL6924(9)307D

Drawn JB Scale 1:1000 @ A1

APPENDIX E

Proposed Plot 5 Drainage Layout



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P2	Site layout updated Architect's latest issue.	CM	AG	03/18
P1	Issued for planning	CM	AG	03/18
Rev	Description	Drm	Vf'd	Date
As outlined in section 2.3 of the CIB Industry Guidance to Designers, insignificant risks can usually be ignored, as can risks arising from routine construction activities, unless the design compounds or significantly alters these risks. In accordance with CDM Regulations 8.9 and 11, any significant risks relating to the design features shown on this drawing have been identified and are annotated thus:				
☒ No significant risks have been identified.				
☐ Significant risks have been identified - refer to notes on drawing for information on residual risks and any control measures to be employed.				
Refer to the current Designer's Risk Assessment sheets for further details.				
Designer's Signature		CM	Date	
			03/18	

Drawing Status
PLANNING

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Also of Leeds, Cardiff, Wirksworth					
Project PLOT 5 ASHROYD BUSINESS PARK ASHROYD WAY HOYLAND BARNLEY					
Client NETWORK SPACE LTD					
Title DRAINAGE LAYOUT					
WmS Project Ref.	Drawn	Date	Scale	@ A1	
11717	CM	09.03.18	1:250		
Drawing/Document Reference					
Project	Originator	Zone	Level	Type Role Number	Status Rev.
11717	WMS	ZZ	XX	DR - C - 39201 - S8 - P2	

Key:	
	Proposed private foul drain
	Proposed private surface water drain
	Proposed foul inspection chamber / manhole
	Proposed surface water sewer inspection chamber / manhole
	Proposed land drain / french drain

- Drawing to be read in conjunction with all other relevant Engineers and Architects details.
- All works to be carried out in accordance with the current British Standards, Codes of Practice, Building Regulations and Sewers for Adoption 6th Edition.
- The exact position, level, size and use of existing sewers to be confirmed on site and any discrepancies are to be reported to the Engineer prior to the commencement of the works.
- All uncovered and shallow pipework to be protected from construction traffic as part of the Contractors temporary works requirement.
- All connections to road gullies to be 150mm diameter.
- All on site pipework to be Polypipe Polysewer (150-300mm dia) and Ridgisewer (375mm dia) to BS EN 1401.
- All pipework entering and exiting manholes to have level soffits.
- Pre-formed channels to be used at all manholes.
- High strength concrete benching to be steel trowelled to a dense smooth face neatly shaped and finished to all branch connections and laid in accordance with the specification.
- Pipe bends to be provided in direction of flow.
- All manhole covers and frames to be heavy duty ductile iron grade D400 double triangular to BS EN124 unless noted otherwise.
- First flexible joint to pipes adjacent manhole shall be 600mm maximum from nearside face of manhole connecting to a rocker pipe. Rocker pipe length to be 600mm.
- All soft spots encountered in the trench formation to be removed and replaced with graded granular material.
- Discharge rates for surface water from the site to the adoptable sewer have been calculated as at least a 30% reduction on the allowable discharge rates as stated in the S104 agreement for the adoptable network. The maximum modelled discharge rates are as follows:
- 1 year = 125.6 l/s
- 30 year = 299.6 l/s
- 100 + 30% c/c = 408.5 l/s

APPENDIX F

Allowable Discharge Rate Calculations

S104 Storm Sewer Ashroyd Bus. Park.

XP Solutions Network 2017.1.2 ©1982-2017 XP Solutions

Pipe Number	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Infiltration Flow (l/s)	Infiltration Vol (m³)	Maximum Vol (m³)	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000 6		15 minute 1 year Winter I+0%	101.200	99.788	-0.137	0.000	0.57				0.178	47.057	93.1	OK
1.001 7		15 minute 1 year Winter I+0%	100.400	98.975	-0.206	0.000	0.22				0.133	47.057	93.1	OK
1.002 8		15 minute 1 year Winter I+0%	97.800	96.028	-0.171	0.000	0.38				0.148	53.590	104.7	OK
2.000 9		15 minute 1 year Winter I+0%	97.750	93.178	-0.102	0.000	0.87				0.384	98.045	208.9	OK
1.003 10		15 minute 1 year Winter I+0%	94.100	92.659	-0.241	0.000	0.43				0.335	157.089	320.2	OK
3.000 11		15 minute 1 year Winter I+0%	94.500	89.477	-0.152	0.000	0.76				0.419	110.665	235.8	OK
1.004 12		15 minute 1 year Winter I+0%	90.700	89.116	-0.359	0.000	0.33				0.897	281.834	579.9	OK
4.000 13		15 minute 1 year Winter I+0%	89.875	87.377	-0.323	0.000	0.31				0.348	72.616	165.0	OK
4.001 14		15 minute 1 year Winter I+0%	89.015	86.594	-0.270	0.000	0.47				1.336	144.660	281.2	OK
1.005 15		15 minute 1 year Winter I+0%	88.600	85.668	-0.219	0.000	0.72				1.979	434.741	880.2	OK
1.006 16		15 minute 1 year Winter I+0%	85.100	83.208	-0.326	0.000	0.43				0.904	439.245	888.2	OK
5.000 17		15 minute 1 year Winter I+0%	83.700	79.742	-0.208	0.000	0.56				0.340	130.579	278.6	OK
1.007 18		15 minute 1 year Winter I+0%	82.850	78.949	-0.365	0.000	0.66				2.135	574.516	1162.0	OK
6.000 19		15 minute 1 year Winter I+0%	82.000	79.020	0.145	0.000	1.28				1.175	216.645	483.9	SURCHARGED
1.008 20		15 minute 1 year Winter I+0%	82.000	78.188	-0.443	0.000	0.51				4.338	791.167	1633.6	OK
1.009 21		15 minute 1 year Winter I+0%	79.500	76.122	-0.505	0.000	0.40				2.486	791.176	1628.2	OK
7.000 22		15 minute 1 year Winter I+0%	83.700	80.118	-0.332	0.000	0.16				0.162	104.527	239.5	OK
1.010 23		15 minute 1 year Winter I+0%	74.800	72.579	-0.256	0.000	0.86				4.662	895.714	1833.0	OK

PLOT 5

PLOT 3

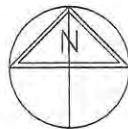
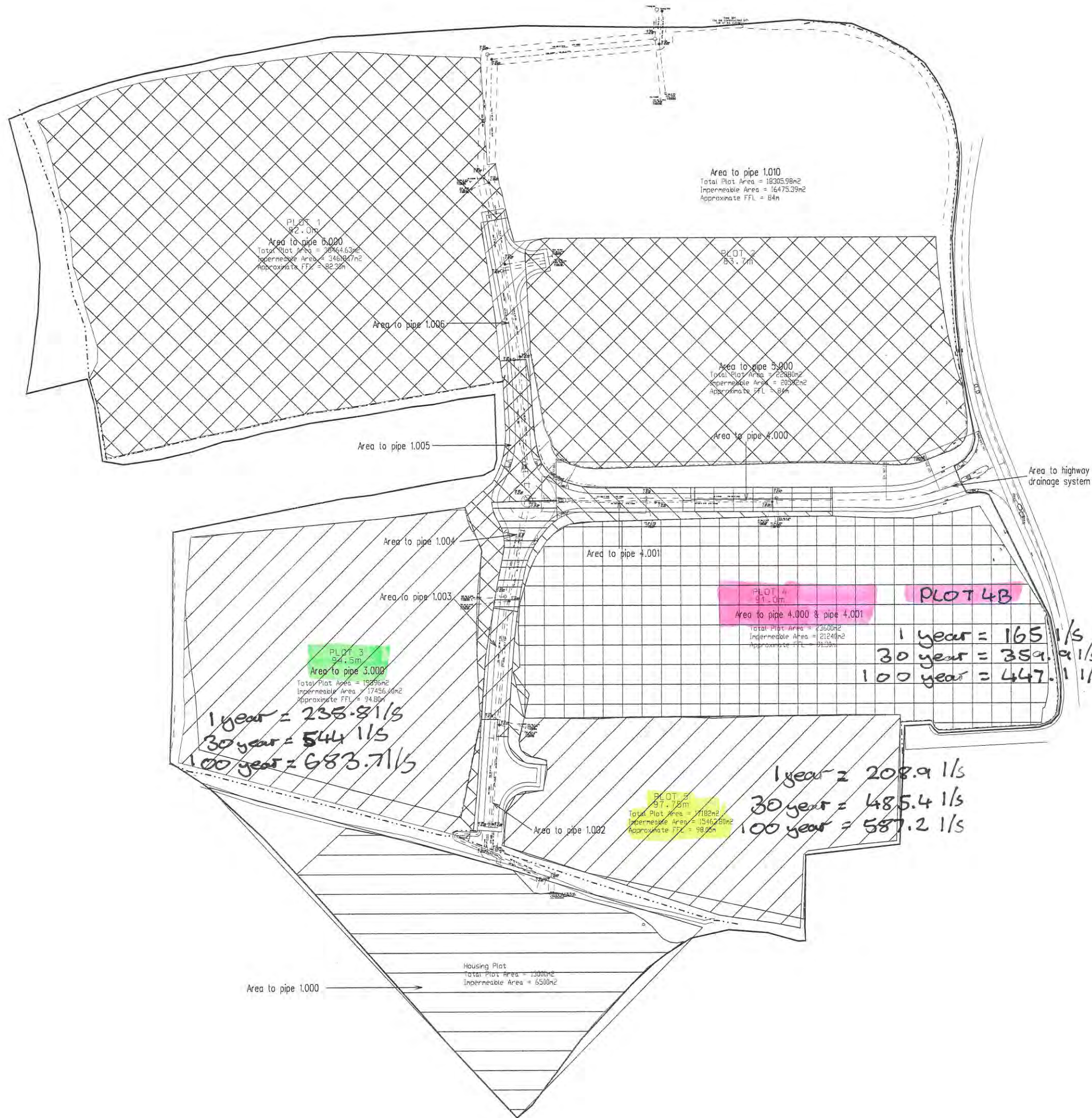
PLOT 4B

Agreed discharge rates from plots

Pipe Number	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Infiltration Flow (l/s)	Infiltration Vol (m³)	Maximum Vol (m³)	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000 6		15 minute 30 year Winter I+0%	101.200	100.380	0.455	0.000	1.27				0.849	115.400	208.1	SURCHARGED
1.001 7		15 minute 30 year Winter I+0%	100.400	99.028	-0.153	0.000	0.48				0.259	115.400	207.6	OK
1.002 8		15 minute 30 year Winter I+0%	97.800	96.115	-0.084	0.000	0.85				0.262	131.420	231.1	OK
2.000 9		15 minute 30 year Winter I+0%	97.750	94.581	1.301	0.000	2.01				2.392	240.440	485.4	SURCHARGED
1.003 10		15 minute 30 year Winter I+0%	94.100	93.173	0.273	0.000	0.96				2.346	385.236	714.9	SURCHARGED
3.000 11		15 minute 30 year Winter I+0%	94.500	90.835	1.206	0.000	1.75				2.363	271.389	544.0	SURCHARGED
1.004 12		15 minute 30 year Winter I+0%	90.700	90.071	0.596	0.000	0.72				6.850	691.152	1256.4	SURCHARGED
4.000 13		15 minute 30 year Winter I+0%	89.875	89.198	1.498	0.000	0.68				3.566	178.074	359.9	SURCHARGED
4.001 14		15 minute 30 year Winter I+0%	89.015	89.016	2.152	0.594	1.09				19.444	354.658	643.1	FLOOD
1.005 15		15 minute 30 year Winter I+0%	88.600	88.339	2.452	0.000	1.43				29.059	1066.030	1743.5	FLOOD RISK
1.006 16		15 minute 30 year Winter I+0%	85.100	83.362	-0.172	0.000	0.85				1.929	1077.075	1757.1	OK
5.000 17		15 minute 30 year Winter I+0%	83.700	81.057	1.107	0.000	1.25				2.222	320.224	624.4	SURCHARGED
1.007 18		15 minute 30 year Winter I+0%	82.850	80.021	0.707	0.000	1.32				11.571	1408.889	2326.4	SURCHARGED
6.000 19		15 minute 30 year Winter I+0%	82.000	80.823	1.948	0.000	2.93				4.361	531.278	1111.3	SURCHARGED
1.008 20		15 minute 30 year Winter I+0%	82.000	78.950	0.319	0.000	1.02				31.240	1940.177	3254.4	SURCHARGED
1.009 21		15 minute 30 year Winter I+0%	79.500	76.880	0.253	0.000	0.81				18.067	1940.188	3259.0	SURCHARGED
7.000 22		15 minute 30 year Winter I+0%	83.700	80.193	-0.257	0.000	0.38				0.269	256.336	587.4	OK
1.010 23		15 minute 30 year Winter I+0%	74.800	74.454	1.619	0.000	1.68				35.920	2196.539	3595.1	FLOOD RISK

XP Solutions Network 2017.1.2 ©1982-2017 XP Solutions

Pipe Number	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Infiltration Flow (l/s)	Infiltration Vol (m³)	Maximum Vol (m³)	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000 6		15 minute 100 year Winter I+0%	101.200	101.059	1.134	0.000	1.57				1.617	149.631	257.2	FLOOD RISK
1.001 7		15 minute 100 year Winter I+0%	100.400	99.049	-0.132	0.000	0.60				0.314	149.632	257.9	OK
1.002 8		15 minute 100 year Winter I+0%	97.800	97.591	1.392	0.000	1.02				2.396	170.403	279.0	FLOOD RISK
2.000 9		15 minute 100 year Winter I+0%	97.750	96.498	3.218	0.000	2.43				5.135	311.764	587.2	SURCHARGED
1.003 10		15 minute 100 year Winter I+0%	94.100	94.121	1.221	21.141	1.02				25.790	499.510	753.3	FLOOD
3.000 11		15 minute 100 year Winter I+0%	94.500	92.302	2.673	0.000	2.20				4.463	351.893	683.7	SURCHARGED
1.004 12		15 minute 100 year Winter I+0%	90.700	90.720	1.245	21.210	0.77				29.906	896.173	1346.1	FLOOD
4.000 13		15 minute 100 year Winter I+0%	89.875	89.718	2.018	0.000	0.85				4.486	230.881	447.1	FLOOD RISK
4.001 14		15 minute 100 year Winter I+0%	89.015	89.099	2.235	83.922	1.61				102.785	460.003	952.1	FLOOD
1.005 15		15 minute 100 year Winter I+0%	88.600	88.623	2.736	23.683	1.47				53.378	1382.394	1792.8	FLOOD
1.006 16		15 minute 100 year Winter I+0%	85.100	84.211	0.677	0.000	0.89				10.320	1396.715	1836.0	SURCHARGED
5.000 17		15 minute 100 year Winter I+0%	83.700	82.885	2.935	0.000	1.45				4.838	415.214	724.4	SURCHARGED
1.007 18		15 minute 100 year Winter I+0%	82.850	81.222	1.908	0.000	1.38				17.950	1826.871	2421.5	SURCHARGED
6.000 19		15 minute 100 year Winter I+0%	82.000	82.022	3.147	21.873	3.36				28.138	688.873	1272.5	FLOOD
1.008 20		15 minute 100 year Winter I+0%	82.000	80.066	1.435	0.000	1.10				37.090	2515.756	3501.6	SURCHARGED
1.009 21		15 minute 100 year Winter I+0%	79.500	77.659	1.032	0.000	0.87				36.946	2515.770	3494.2	SURCHARGED
7.000 22		15 minute 100 year Winter I+0%	83.700	80.224	-0.226	0.000	0.50				0.314	332.374	761.6	OK
1.010 23		15 minute 100 year Winter I+0%	74.800	74.817	1.982	17.801	1.80				58.557	2848.162	3856.5	FLOOD



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INFORMATION			
DESIGN		ACG	09/00
BUILDING CONTROL			
PLANNING		ACG	09/00
MEASUREMENT		ACG	09/00
TENDER			
CONSTRUCTION			
FINAL ISSUE INCORPORATING ALL AUTHORISED VARIATIONS			
RISK ASSESSMENT ckd			
ACCESS/DDA COMPLIANCE CHECK			DATE
REV		DESCRIPTION	CKD DATE
A		Redrawn	ACG 01/05
B		General redesign to SFA 5th	ACG 07/05
C		Plot Areas, Impermeable Areas and FFL added	ACG 08/05
D		Plot Areas & Impermeable Areas amended	ACG 09/05

W^M SAUNDERS PARTNERSHIP | WSP

ARCHITECTS
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QUANTITY SURVEYORS
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Project

Proposed Infrastructure Works,
Ashroyd Business Park,
nr. Barnsley.

Client
Ackroyd & Abbott Ltd.

Title
S.104 Works - Areas

Date Sept '00 Drawing No. SL6924(9)307D

Drawn JB Scale 1:1000 @ A1



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